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UTILITY PATENT APPLICATION TRANSMITTAL

Only for new nonprovisional applications under 37 C.F.R. § 1.53(b)

Attorney Docket No.	BLO1-134-006C
First Inventor or Application Identifier	Anderson et al.
Title	SYSTEM FOR ON-LINE FINANCIAL SERVICES USING DISTRIBUTED OBJECTS
Express Mail Label No.	EL039914724US

APPLICATION ELEMENTS
See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO:
Assistant Commissioner for Patents
Box Patent Application
Washington, DC 70231

1. [X] • Fee Transmittal Form (e.g., PTO/SB/17)
   (Submit an original and a duplicate for fee processing)

2. [X] Specification [Total Pages 15]
   (preferred arrangement set forth below)
   - Descriptive title of the Invention
   - Cross References to Related Applications
   - Statement Regarding Fed sponsored R & D
   - Reference to Microfiche Appendix
   - Background of the Invention
   - Brief Summary of the Invention
   - Brief Description of the Drawings (if filed)
   - Detailed Description
   - Claim(s)
   - Abstract of the Disclosure

3. [X] Drawing(s) (35 U.S.C. 113) [Total Sheets 2]

4. Oath or Declaration [Total Pages 3]
   a. [ ] Newly executed (original or copy)
   b. [X] Copy from a prior application (37 C.F.R. § 1.63(d)) (for continuation/divisional with Box 16 completed)
      I. [ ] DELETION OF INVENTOR(S)
      Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

NOTE FOR ITEMS 1& 13: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 CFR, § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28)

5. [ ] Microfiche Computer *Program (Appendix)*

6. Nucleotide and/or *Amino Acid Sequence Submission (if applicable, all necessary)*
   a. [ ] *Computer* Readable Copy
   b. [ ] *Paper Copy* (identical to *computer copy*)
   c. [ ] Statement verifying *identity of* above copies

ACCOMPANYING APPLICATION PARTS

7. [ ] Assignment *Papers (cover sheet & document(s))*
8. [ ] 37 C.F.R.§3.73(b) Statement *(when there is an assignee)* [ ] Power of Attorney
9. [ ] English Translation Document *(if applicable)*
10. [X] Information Disclosure Statement (IDS)/PTO-1449 [X] Copies of IDS Citations
11. [ ] Preliminary Amendment
12. [X] Return Receipt Postcard (MPEP 503) *(Should be specifically itemized)*
13. [ ] • Small Entity Statement(s) (PTO/SB/09-12) [ ] Statement filed in prior application, Status still proper and desired
14. [ ] Certified Copy of Priority Document(s) *(if foreign priority is claimed)*
15. [ ] Other: _____

16. **If a CONTINUING APPLICATION**, check appropriate box, and supply the requisite information below and in a preliminary amendment:
   [X] Continuation [ ] Divisional [ ] Continuation-in-part (CIP) of prior application No: 08 ,902,239
   Prior application information: Examiner M. Rinehart Group/Art Unit: 2756
   For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

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Date	March 31, 2000

APPLICATION FOR UNITED STATES LETTERS PATENT

FOR

SYSTEM FOR ON-LINE SERVICES USING DISTRIBUTED OBJECTS

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SYSTEM FOR ON-LINE FINANCIAL SERVICES USING DISTRIBUTED OBJECTS

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             Jacob B. Geller

This application is a continuation of U.S. Patent Application Serial No. 08/902,239 entitled SYSTEM FOR ON-LINE SERVICES USING DISTRIBUTED OBJECTS, filed July 29, 1997 and allowed on December 7, 1999, which is a continuation of U.S. Patent Application Serial No. 08/580,074, filed December 20, 1995, entitled SYSTEM FOR ON-LINE FINANCIAL SERVICES USING DISTRIBUTED OBJECTS, which is now U.S. Patent 5,706,442, issued January 6, 1998.

BACKGROUND AND SUMMARY OF THE INVENTION

The present invention relates generally to client/server computer systems. Particularly, the present invention relates to a client/server architecture for delivering financial services to customers of various financial institutions.

Customers of various types of financial institutions such as banks, stock brokerages, credit card companies, and insurance companies often have a need to access information regarding recent account activity or their account balances. Typically, financial information is reported to customers in the form of monthly statements that list the account's activity and balance for the previous month. By the time these statements are processed and sent, they no longer reflect the current state of the account. Account balances may change on a daily basis for a variety of reasons including the addition of interest earned or the processing of a new transaction.

Customers in need of more timely information regarding their accounts usually have the option of calling a customer service representative of the financial institution to request a balance or activity report. Although the information is timely, it may be difficult or inconvenient to obtain. First, customers must call each institution from which they would like to obtain current information. When calling, they may need to wait for someone who can help. At other times, they may be required to traverse many levels of an automated attendant before reaching an option that will allow them to accomplish a specific task such as obtaining a current account balance. In either case, the information is presented verbally rather than in a written form that more closely resembles a statement. Finally, whether the information is communicated verbally or through a written statement, customers who wish to use the information in a computer program must enter it manually. In addition to the inconvenience, the process of manually entering the data is also error prone.

Customers of various financial institutions therefore, have a need to access recent financial information at their own convenience—preferably, from anywhere and at any time. Furthermore, customers have a need to see the financial data presented in an organized and understandable format similar to the monthly statement format with which customers are familiar. The present invention—Conductor^{SM} System Architecture (Conductor)—supports a suite of on-line financial services from various financial services providers. Supported services include credit card account lookup and reporting, and checking and bill paying. In addition, customers and financial services providers may communicate with each other. Finally, the financial information obtained electronically may be downloaded directly to customers' personal computers for further processing. The need for manual data entry is eliminated.

The present invention is a sophisticated computer software system based on distributed system technology. Within the system, use of the TCP/IP protocol suite for communications with major components of the system allows the financial services to be accessed through the Internet. The same services may also be accessed directly through an on-line information service such as CompuServe®. Conductor supports a distributed "information cluster" located on the global Internet so it may be accessed at any time from around the world using any one of a number of presentation tools. A variety of financial services from a number of independent financial services providers are supported by the system so that users may review activity and balances relating to different types of accounts. The ability to use a variety of presentation tools to access a suite of financial services supported by a variety of financial services providers is unique to the present invention. The advantages of the present invention and others are explained further by the accompanying drawings and detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a diagram of the Conductor Network illustrating the components of a financial information service system based on the Conductor System Architecture; and

Figure 2 is a block diagram of the Conductor System Architecture.

DETAIL DESCRIPTION OF PREFERRED EMBODIMENT(S)

The Conductor System Architecture (Conductor) and its related protocols provide a robust suite of on-line Interfaces for use by applications, financial service providers, Web (hyper-text transfer protocol—HTTP) servers, and other clients to obtain and manipulate financial

information for users of the system. Applying principles of modularity and abstraction, distributed systems technologies are used to define the major components of Conductor and their interrelationships to allow delivery of diverse types of financial services over a wide area network. Sources of data may be as varied as the Interfaces to it. Financial information systems using the approach of Conductor are easily extensible because Conductor is based on a platform-portable, language-independent distributed object framework. Client components and server components work in concert to provide timely financial information to users of an on-line financial information system built using Conductor. Use of the distributed approach of a client/server model permits the easy integration of new services and providers for the system. For example, server components of Conductor may easily serve as back-end resources for existing on-line service providers. The distributed approach also allows applications running in the system to be accessible through a number of presentation tools or users interfaces (collectively, clients): for example, native Microsoft® Windows® applications, Web (hyper-text mark-up language—HTML) browsers, text-terminals, X.25 transactions, even voice telephony.

Referring to Figure 1, a diagrammatic representation of the Conductor Network is shown. The Conductor Network illustrates use of the Conductor System Architecture to provide a suite of financial services accessible through different user interfaces. Preferably, users connect to the suite of on-line financial services in the Conductor Network via the Internet 12. Methods for providing services via the Internet are well-known in the art and are not explained here. Host computers in the network are accessible world-wide from any site with TCP/IP name resolution and packet routing to the *conductor.com* domain. Preferably, host computers running the Windows NT™ Operating System and the UNIX® Operating System are used in the distributed

environment. Clients and servers may run on any of twenty operating systems. Multiple user interfaces to applications that are part of the Conductor Network are implemented as different types of clients. As shown in Figure 1, a user may communicate with a financial application via a Web (hyper-text markup language-HTML) browser 10 or via the CompuServe Information Service 14 using the CompuServe Information Manager for Windows® (WinCIM®) 16. Other methods of access may be used as well—for example, a native Microsoft® Windows® application. In addition, Conductor components may include financial services that are part of an on-line information service so that they are available only to subscribers of the on-line information service.

As shown in Figure 1, packets destined for the Conductor Network are routed 18 to a Web Server 22 for processing. Because security is a significant issue for on-line financial information systems, a Firewall 20 is established between the Router 18 and the Web Server 22. User verification and data access may then occur in a secure environment. Separate user connect/data access protocols isolate internal/external networks. An indirect method of user identification is used to secure account numbers and sensitive data are passed via two-key encryption. Token passing is used for connected host identification.

The Conductor System Architecture is itself built on a Common Object Request Broker Architecture (CORBA)-compliant Distributed Object Computing Platform. This development platform is well-known in the art and is not explained here. Primary system components include Financial Object Servers, Distributed Name (or Name Lookup) Servers, and Database Servers. Other components include Communication, Security, and Logging servers. As shown in Figure 1, a number of Distributed Name (or Name Lookup) Servers 24, 26, 28 and Financial Object

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Servers 30, 32, 34 may be in operation at one time. When running, these servers may communicate with a Legacy System 38 or other Database Servers 36 in order to respond to specific requests for information. Data requests may be serviced in any one of a number of ways. For example, data may be accessed using a Microsoft® SQL Server running on Windows NT™.

Clients and servers in a Conductor based system communicate according to an application-level protocol. The application-level protocol specifies how a client interprets data sent to it by a server. Differences in the implementation of various services are hidden behind this consistent API. Within applications, the protocol for communication between various components is a call-level API. When one part of the application needs something, it calls a procedural interface in another part. Such calls do not return until the procedure has executed so the flow of control is simple and direct. Extending these synchronous procedure calls across the network interface has the advantage of simplifying the access to distributed resources by elevating it to the level of standard procedural mechanisms familiar to a majority of developers.

Clients in a Conductor system have an object-oriented Application Programming Interface (API) to the distributed resources or services using a class-like construct called an "Interface" which groups operations and attributes. Interfaces are used by applications, financial service providers, Web (hyper-text transfer protocol-HTTP) servers, and clients to obtain and manipulate financial information for users of the system. Because clients know only the nature of the Interface, it may be implemented in any manner. For example, Interfaces may be implemented in one language and clients in another. The implementation of an Interface may then be altered at will without affecting any clients. As long as the protocol to the Interface is stable, the client implementation is stable.

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Clients located anywhere on the global Internet ask for and bind to services by name. Clients locate Interfaces by naming a server which implements one, and they may do so from any site with a TCP connection to the Conductor domain (*conductor.com*). The names of servers are provided by a name lookup Interface which runs on the only host whose name clients need to know. Following name lookup, a client begins communication with a server capable of servicing the client's specific request. The access is synchronous and call-level using either C++, Smalltalk, or C. In other words, clients access services by making standard synchronous procedure calls. Client load is automatically apportioned among all ready object servers at lookup time.

There are several benefits to using name lookup to connect clients and servers. A name lookup layer isolates clients from the location or readiness of any individual server. Although the financial information system is based on the Internet Protocol (IP), clients are completely isolated from back-end data sourcing concerns and do not need to know the IP addresses of servers. Using this approach, servers may be added simply by connecting to the network, installing system and server software, and adding the machine name to the lookup database. Consequently, clients are not affected by database, network, operating system, hardware platform, or server architectural changes. For example, native 32-bit Windows® applications may use client-side abstraction libraries that hide details of binding to and executing calls on remote servers. Servers may be implemented on cheap, fast Intel-based Windows NT™ network servers and new servers may be added to the system by copying files over and adding the host name to a single locator file. The distributed nature of the system means that it is composed of relatively simple

applications that implement a single Interface or a small group of Interfaces through which clients and servers communicate.

Another benefit of using name lookup to connect clients and servers is that servers may have geographical independence. Site independence for servers means that different servers may be developed and maintained by different financial services providers. User access mechanisms provided by clients remain the same so users may access new financial services using familiar methods.

The interface between clients and servers is binary. For various reasons, a binary interface to information and services is preferable to a textual one. Such an interface is more efficient and the data may be useful in more varied applications. Binary data may be converted to text for viewing by humans, sent in binary form to other providers, or retrieved in binary form and processed by a consumer application. Binary objects may be dragged off of a window and dropped into a finance application or they may be used to generate reports.

Referring to Figure 2, a diagram of the client and server components of a financial information system based on the Conductor System Architecture is shown. Among the server components supported by Conductor are databases. For example, financial information of interest to users of the system is contained in different databases 52, 58, 40 within the distributed environment. Each database has its own access mechanism 50, 56, 62. As explained earlier, among the methods for accessing a system based on the architecture are a Web (hyper-text markup language-HTML) browser 10 that communicates through a Web Server 22 or a native Windows® application 14.

The Firewall 20 increases system security of applications running in the Conductor environment. The TCP/IP protocol stack 46 is the Internet communication vehicle. Another Conductor component—the Object Request Broker (ORB)—is an "information bus" that connects clients to the servers or *objects* they need in a heterogeneous environment. By definition, an ORB is platform independent, language neutral, and may run in many networked environments. In other words, ORBs provide interoperability between applications on different machines in a heterogeneous environment. ORBs implemented in one language may communicate with those implemented in another, on a completely different hardware platform. The same is true for the object implementations to which the ORB provides access. Three example objects are shown in Figure 2—a card object 48, a checking object 54, and a bill pay object 60. The objects serve as links between clients 10, 14 and data contained in the databases 52, 58, 40. The name server 24 performs the name lookup function for clients so they may establish communication with the financial object that performs the needed services.

The distributed nature of the Conductor System Architecture means that a financial services system may be composed of relatively simple financial services applications accessible from one of several interfaces. The result of this is that each financial service application is easier to develop and maintain, and the Conductor-based financial services system at large is more flexible and robust. The present invention has been described in the form of preferred embodiments. However, several modifications and variations may be made to the invention and fall within the scope of the claims.

WHAT IS CLAIMED IS:

1.   An on-line financial information service system based on a distributed system architecture, comprising:

at least one financial information server for processing financial information requests;

an identification for said financial information server;

at least one data server for processing requests for data from said financial information server;

an electronic financial information request from a client;

at least one identification server for processing said electronic financial information request from said client by locating said financial information server, in accordance with said financial information server identification; and

a communication link between said client and said financial information server associated with said financial information server identification.

2.   The system of claim 1 wherein said identification is a name for said financial information server.

3.   The system of claim 1 wherein said client and said financial information server communicate in accordance with a binary interface.

4.   The system of claim 3 wherein said communication link between said client and said financial information server is determined in accordance with said binary interface.

5.   A system for interfacing a client to one of a plurality of financial information servers, comprising:

a name for each one of said plurality of financial information servers;

a name server for storing said name and financial information server pairs;

a financial information service request from said client;

a first communication link between said client and said name server for transferring a name for said one of said plurality of financial information servers to said name server and for transferring a location for said financial information server associated with said name to said client; and

a second communication link between said client and said financial information server with said location.

6. The system of claim 5 wherein said client and said financial information server communicate in accordance with a binary interface.

7. The system of claim 6 wherein said communication link between said client and said financial information server is determined in accordance with said binary interface.

8. A system for processing financial information requests, comprising the steps of:

associating a name with each of a plurality of financial information servers;

generating a financial information request, said request generated by a client;

transmitting said financial information request to a name server; looking up at said name server a location for one of said plurality of financial information servers;

establishing a communication link between said client and a financial information server at said location.

9.   The method of claim 8 wherein the step of establishing a communication link comprises the step of establishing a communication link in accordance with a binary interface between said client and said financial information server at said location.

10.   The method of claim 8, wherein said unique identification includes a unique name for each of said financial information servers.

11.   The method of claim 8, wherein said unique identification includes a unique address for each of said financial information servers.

12.   A system for processing financial information requests, comprising:

a plurality of financial information objects adapted for processing financial information requests;

a plurality of clients, said clients adapted for communication with said plurality of financial information objects;

a plurality of interfaces, each of said interfaces associated with at least one of said plurality of financial information objects;

a plurality of names, each of said names associated with at least one of said interfaces;

a financial information request from one of said plurality of clients;

a name of one of said plurality of names associated with said financial information request;

a communication link between said client requesting said financial information and said financial information object associated with said name, said communication link established in accordance with the interface associated with said name and said financial information object.

13.   The system of claim 13 wherein the interface is binary.

14.   The system of claim 13 wherein said financial information objects are two or more

selected from the group consisting of a bill pay object, a card object, and a checking object.

ABSTRACT

A system is disclosed for accessing recent financial information from various financial services providers. The system is based on a client/server architecture so that services are accessible from a variety of presentation tools. Communications between clients and servers are accomplished using "Interfaces" that group operations and attributes for various services. The system uses the TCP/IP protocol suite so financial services are available at any time and from any location.
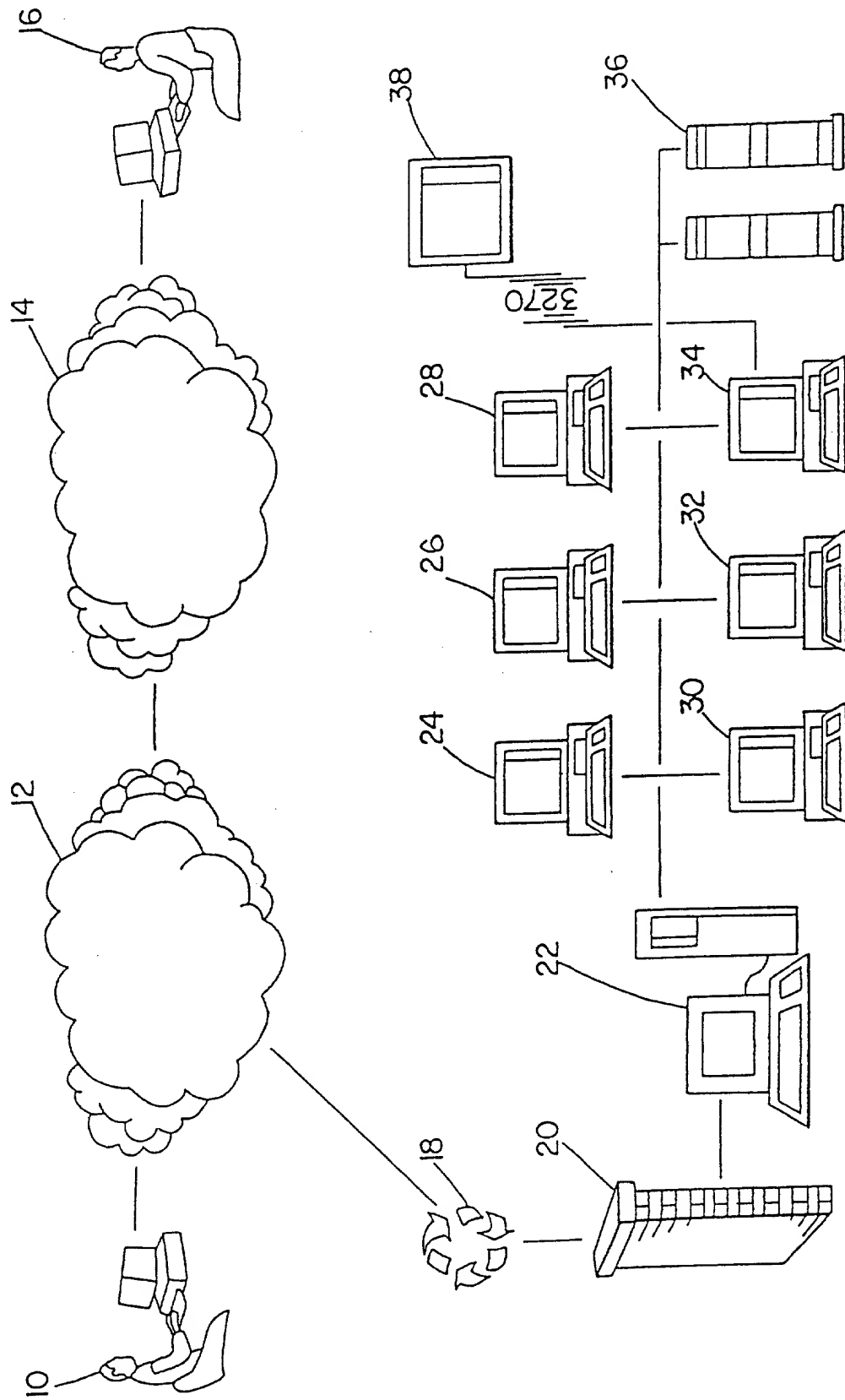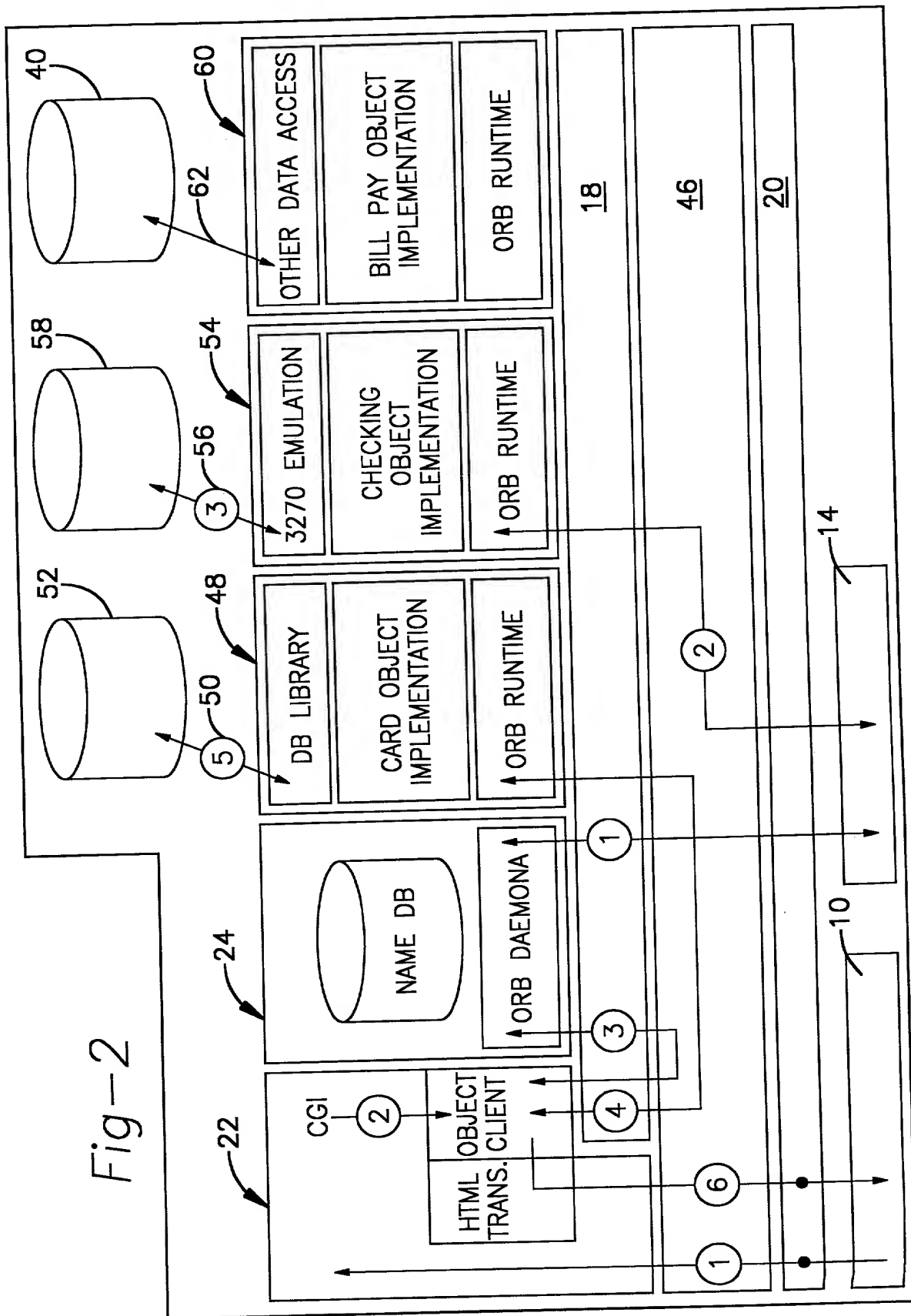
Fig.1

Fig-2

DECLARATION
AND
POWER OF ATTORNEY

As below named inventors, we hereby declare that:

Our residences, post office addresses and citizenship are as stated below next to our names.

We believe we are the original, first and sole inventors of the subject matter which is claimed and for which a patent is sought on the invention entitled SYSTEM FOR ON-LINE FINANCIAL SERVICES USING DISTRIBUTED OBJECTS the specification of which

(check one)   [·] is attached hereto.

          [X] was filed on December 20, 1995 as
              Application Serial No. 08/580,074
              and was amended on _____ (if applicable)

We hereby state that we have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

We acknowledge the duty to disclose information which is material to the patentability of the invention claimed in this application, in accordance with Title 37, Code of Federal Regulations, §1.56(a) and (b).

We hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

			Priority Claimed	
			[ ]	[ ]
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
			[ ]	[ ]
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
			[ ]	[ ]
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No

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We hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, we acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulation, §1.56(a) and (b) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status) (patented, pending abandoned)

(Application Serial No.) ·	(Filing Date)	(Status) (patented, pending abandoned)

We hereby appoint Jeffrey S. Standley, Reg. No. 34,021 and/or Roger A. Gilcrest, Registration No. 31,954, c/o Standley & Gilcrest, 555 Metro Place North, Suite 500, Dublin, Ohio 43017, Telephone No. (614) 792-5555 our attorneys, with full power in each of them, of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith. All correspondence should be sent to the attention of **Jeffrey S. Standley, Esq.** at the address above.

We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application of any patent issued thereon.

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